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| 10/564,559      | 04/16/2007  | Wolfgang Frings      | TROPL-0020          | 2050             |

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| EXAMINER |
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TRAN, BINH X

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| ART UNIT | PAPER NUMBER |
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1792

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02/18/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/564,559 | <b>Applicant(s)</b><br>FRINGS ET AL. |  |
|                              | <b>Examiner</b><br>Binh X. Tran      | <b>Art Unit</b><br>1792              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1-13-2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: The "Brief Description of the Drawings" section is missing from the specification.

Appropriate correction is required.

### ***Claim Interpretation***

2. In line 3 of claim 6, the applicants recite "optionally Al<sub>2</sub>O<sub>3</sub>, Nb<sub>2</sub>O<sub>3</sub> ....formates or acetate". The examiner interprets the term "optionally" means in left to one's choice, not required or mandatory. Thus, the examiner reserves the right to give no patentable weight on any limitation right after the term "optionally".
3. Claims 1-4, 10 are drawn to a product-by process. According to MPEP 2113 "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production". Thus, the examiner does not give any patentable weight on the method of production.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 and claim 5, the applicants recite the term "pore free" to characterize the metal oxide layer. However, it appears that such material always has a certain porosity, though the pore size is not defined. Thus, it is unclear from the claims what specific porosity that applicants consider as "pore free".

Claims 1-4, 10 are indefinite because they directly or indirectly depend on indefinite claim 1.

In claim 5, applicants recite "organic suspension medium" in step (a)-(d). It is unclear from the claim whether the "organic suspension medium" in step (a) and step (d) comprises the same composition or different composition. If the "organic suspension medium" in step (a) and step (d) are different, the examiner suggest to use the label "first" and "second" (i.e. first suspension medium, second suspension medium) in order to avoid any confusion.

Claims 6-9 are indefinite because they directly or indirectly depend on indefinite claim 6.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "water" in claim 7 is used by the claim to mean "organic suspension", while the accepted meaning is "inorganic suspension." The term is indefinite because the specification does not clearly redefine the term.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-3, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (US 6,908,698 B2) in view of Lansink Rotgerink et al. (US 2002/0077246 A1).

Respect to claim 1, Yoshida discloses a photocatalytically active coating comprises a substrate (10), a first underlayer (14) applied to the substrate and composes of inorganic polymer mixture comprises SiO<sub>2</sub> and ZrO<sub>2</sub> (abstract, col. 4 lines 10-25; col. 10 lines 15-25); and a second layer (16) comprises TiO<sub>2</sub>, wherein the underlayer is a solid layer and comprises 0% by weight of TiO<sub>2</sub> (read on less than 0.5 by weight of TiO<sub>2</sub> and is pore free).

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Yoshida fail to disclose the underlayer comprises  $\text{SiO}_2$  and  $\text{ZrO}_2$  in a ratio by weight of from 50:50 to 95:5. Lansink Rotgerink teaches to disclose a catalyst support having to control the weight percent individual metal oxide in the mixture. In one example Lansink Rotgerink teaches to use 5 wt% of  $\text{ZrO}_2$  and 95 wt% of  $\text{SiO}_2$  (paragraph 0147, read on applicants ratio of 95:5). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Yoshida in view Lansink Rotgerink by control the weight percent of  $\text{SiO}_2$  and  $\text{ZrO}_2$  to obtain optimal ratio because it has been held that determination of workable range is not consider inventive.

Respect to claim 2, Yoshida discloses the inorganic polymer further comprises  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  (abstract, col. 4 lines 15-22). Respect to claim 3, Yoshida discloses Respect to claim 10, Yoshida discloses to use the coating for window for automobile and construction (col. 4 lines 41-50)

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida and Lansink Rotgerink as applied to claims 1-3, 10 above, and further in view of Finley (US 2002/0045073).

Respect to claim 4, Yoshida and Lansink Rotgerink fail to substrate comprises one or more polymers selected from the group of PVC, PP, PE, PMMA, PS, PC, polyesters, epoxy materials, polyurethanes, polyisocyanates, SBR, ABS, ASA, NBR, or copolymers composed of acrylonitrile, styrene, butadiene, methacrylate, or isoprene, in each case in the form of homo- or copolymer, in the form of coextrudate, or in the form of polymer blend. However, Yoshida clearly teaches to use transparent substrate. Finley teaches to use transparent, translucent selected from the group consist of

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polycarbonate (PC), polyacrylates, transparent glass in the form of homo polymer or polymer blend (paragraph 0023). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Yoshida and Lansink Rotgerink by using polycarbonates because equivalent and substitution of one for the other would produce an expected result.

10. Claims 1-3, 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazu et al. (US 2003/0025997 A1) in view of Lansink Rotgerink et al. (US 2002/0077246 A1).

Respect to claim 1, Kawazu discloses a photocatalytically active coating comprises a substrate (11), a first underlayer (12) applied to the substrate and composes of inorganic polymer mixture comprises  $\text{SiO}_2$  and  $\text{ZrO}_2$  (paragraph 0025, 0017-0018); and a second layer (13) comprises  $\text{TiO}_2$  particles (paragraph 0039), wherein the underlayer is a solid layer (read on pore free).

Kawazu fail to disclose the underlayer comprises less than 0.5 by weight of  $\text{TiO}_2$  particles and  $\text{SiO}_2$  and  $\text{ZrO}_2$  in a ratio by weight of from 50:50 to 95:5 and. Lansink Rotgerink teaches to disclose a catalyst support having to control the weight percent individual metal oxide in the mixture. In one example Lansink Rotgerink teaches to use 5 wt% of  $\text{ZrO}_2$  and 95 wt% of  $\text{SiO}_2$ , and 0 wt %  $\text{TiO}_2$ , (paragraph 0147, read on applicant's ratio of 95:5 and less than 0.5 wt%  $\text{TiO}_2$ ). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Yoshida in view Lansink Rotgerink by control the weight percent of  $\text{SiO}_2$  and  $\text{ZrO}_2$ ,  $\text{TiO}_2$  to obtain optimal

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ratio because it has been held that determination of workable range is not consider inventive.

Respect to claim 2, Kawazu discloses the inorganic polymer further comprises tantalum oxide (aka  $Ta_2O_3$ ), aluminum oxide ( $Al_2O_3$ ), and niobium oxide ( $Nb_2O_3$ ) (See paragraph 0025). Respect to claim 3, Kawazu discloses the under layer (12) comprises at least two layer of group A and B applied in succession of different constitution (paragraph 0025).

Respect to claim 5, Kawazu discloses a method comprising the step of

a) coating of a substrate with an inorganic polymer by solution chemistry via application of a suspension of the inorganic polymer or its chemical precursors in an organic suspension medium (paragraph 0008-0010);

b) complete or partial removal of the organic suspension medium (i.e. drying), to give an underlayer (paragraph 0047-0054);

c) application of a dispersion composed of  $TiO_2$  particles in an organic dispersion medium to the underlayer;

d) complete or partial removal of the organic dispersion medium (drying) to give an overlayer (paragraph 0055);

e) heat-treatment of the under- and overlayer (paragraph 0054-0055).

Kawazu fail to disclose the underlayer comprises less than 0.5 by weight of  $TiO_2$  particles and  $SiO_2$  and  $ZrO_2$  in a ratio by weight of from 50:50 to 95:5 and less than 0.5 wt%  $TiO_2$ . Lansink Rotgerink teaches to disclose a catalyst support having to control the weight percent individual metal oxide in the mixture. In one example Lansink



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Rotgerink teaches to use 5 wt% of  $\text{ZrO}_2$  and 95 wt% of  $\text{SiO}_2$ , and 0 wt %  $\text{TiO}_2$ , (paragraph 0147, read on applicant's ratio of 95:5 and less than 0.5 wt%  $\text{TiO}_2$ ). Lansink Rotgerink further discloses to perform a heat treatment at 110 °C to produce a metal oxide layer (paragraph 0147). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Yoshida in view Lansink Rotgerink by control temperature, the weight percent of  $\text{SiO}_2$  and  $\text{ZrO}_2$ ,  $\text{TiO}_2$  obtain optimal ratio because it has been held that determination of workable range is not consider inventive.

Claim 5 differ from Kawazu and Lansink Rotgerink by this specific heating time. However, Lansink Rotgerink clearly teaches to heat at a temperature at 110 °C (paragraph 0147). It would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to determine optimal heating time because it has been held that determination of workable range is not consider inventive.

Respect to claim 6, both Kawazu and Lansink Rotgerink disclose the underlayer  $\text{SiO}_2$  and  $\text{ZrO}_2$  (Kawazu (paragraph 0018, 0025, Lansink Rotgerink paragraph 0147). Respect to claim 7, Kawazu discloses the organic solvent include acetic acid, ethanol, isopropyl alcohol (aka isopropanol), glycol, ethylene glycol (paragraph 0053, 0057).

Respect to claim 8, Kawazu discloses the under layer (12) comprises at least two layer of group A and B applied in succession of different constitution (paragraph 0025). Since the underlayer comprises two different layers, step (a) and (b) of the process must carried twice in succession. Respect to claim 9, Kawazu discloses the overlayer comprises a plurality of layer (See Fig 4-5). Since the overlayer comprises plurality of layer, step (c) and (d) of the process must carried at least twice in succession.

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11. Claims 4, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazu and Lansink Rotgerink as applied to claims 1-3, 5-9 above, and further in view of Finley (US 2002/0045073).

Respect to claim 4, Kawazu and Lansink Rotgerink fail to substrate comprises one or more polymers selected from the group of PVC, PP, PE, PMMA, PS, PC, polyesters, epoxy materials, polyurethanes, polyisocyanates, SBR, ABS, ASA, NBR, or copolymers composed of acrylonitrile, styrene, butadiene, methacrylate, or isoprene, in each case in the form of homo- or copolymer, in the form of coextrudate, or in the form of polymer blend. However, Kawazu clearly teaches to use glass substrate. Finley teaches to use transparent, translucent selected from the group consist of polycarbonate (PC), polyacrylates, transparent glass in the form of homo polymer or polymer blend (paragraph 0023). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Kawazu and Lansink Rotgerink by using polycarbonates because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 11, Finley disclose the coating is used for automotive window, skylight, insulating glass unit, windshield, side or back window, sun roof (paragraph 0023).

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571)272-

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1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Binh X Tran  
Primary Examiner  
Art Unit 1792

/Binh X Tran/  
Primary Examiner, Art Unit 1792